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Roman dominion. Now it is exceedingly interesting to see history and geology uniting for the purpose of solving questions relative to recent formations*.

XXVII. *On the Polarization of Light by Living Animals.*
By J. F. GODDARD, Lecturer on Optics, &c. at the Royal
Gallery of Practical Science.

To the Editors of the *Philosophical Magazine and Journal of Science.*

GENTLEMEN,

ON repeating the experiments published in 1816, and others subsequently noticed by Sir D. Brewster, on the polarizing property in the eyes of fishes and other animal substances, with my Polariscopes, after observing that the *scarf skin* of the human subject, sections of *human teeth*, the *finger nails*, *bones of fishes*, &c. possessed the same property, I was led to examine some living objects, when I discovered that, among many others, the larvæ and pupa of a tipulidan gnat (the *Corethra plumicornis*) possessed this property also, and that in a very eminent degree. Its existence in the different substances above enumerated is exceedingly interesting and important; but that it should also exist in living animals is infinitely more so, and opens a new field altogether, disclosing characters that lead to an intimate knowledge of their anatomy, and which cannot possibly be discovered by any other means.

This creature is found in large clear ponds, generally in great abundance when met with, but this is by no means common. Having constructed a water trough, made with two slips of glass about 1·25 inch wide and two inches long, with very narrow slips of thin glass cemented with Canada balsam between them, at the bottom and sides, thus leaving it open at one end with about the 0·050 of an inch space between in the middle, I filled it with clear water in which I placed some of the larvæ; and such is the extraordinary transparency of the creature, as to display in a most beautiful manner the whole of their internal structure and organization, and which, when viewed in polarized light, presents the most splendid appearances. Thus when they place them-

* The papers of this kind on the æstuary of the Yare by Messrs. J. W. Robberds, and R. C. Taylor, *Phil. Mag. & Annals*, N.S. vols. i. ii. 1827, and those of Mr. Lyell, and Mr. Babbage, &c. have lately become the subject of discussion in the *Discorso* of Sig. D. Paoli, "Del Sollevamento e del Avvallamento di alcuni Terreni:" Pesaro, 1838.—Ed.

selves with their head and tail both in the plane of primitive polarization, or in a plane at right angles to it, they have no action upon the light transmitted through them; but when in a plane inclined 45° to the plane of polarization, the light is depolarized, their whole bodies becoming illuminated in the most brilliant manner, varying in intensity according to their size, and the nature of the different parts and substances; the peculiar interlacing of the muscles marking out regular divisions, which, as the creature changes its position with regard to the plane of polarization, exhibit all the varied hues and brilliant tints that have rendered this important branch of physical optics so exceedingly interesting.

And while thus viewing them, if we place behind a thin plate of sulphate of lime or mica, the change and play of colours as the creature moves are greatly increased, and are exceedingly beautiful.

These phænomena in the larvæ of the *Corethra plumicornis* are seen if possible in a more splendid manner in the spawn of many large fishes, but more particularly in the young fishes themselves, which in their early state are, many of them, equally transparent, particularly those of marine production.

The first time I showed them was on the 7th June to Mr. F. Watkins, afterwards to T. E. Wilks, Esq. and other gentlemen; and on Tuesday evening the 25th June, I read some notes on the subject, and exhibited them with many other experiments, to the members of the Zoological Society, at one of their regular meetings.

J. F. GODDARD.

XXVIII. *Intelligence and Miscellaneous Articles.*

ANTARCTIC EXPEDITION.—TERRESTRIAL MAGNETISM.

THE preparations for the Expedition to the Antarctic Regions under the command of Capt. Jas. Ross, are in great forwardness; and the instructions, drawn up with a view to render it of the greatest service to every branch of science, have occupied the attention of all the committees of the Royal Society.

Observations on the phænomena of terrestrial magnetism being among the principal objects of the voyage, a translation of Professor Gauss's General Theory, which has been made for the furtherance of this object under the direction of Sir J. Herschel, will appear next week in the Sixth Part of the Scientific Memoirs, in addition to other papers on the same subject by Gauss and Weber, which have been prepared under the inspection of Major Sabine and Professor Lloyd.